

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2

Owner of the Declaration	Sager AG
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-SAR-20200274-CBA2-EN
Issue date	05/11/2021
Valid to	04/02/2026

SAGLAN glass wool, bonded with bio-based adhesive Sager AG

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General Information

Sager AG

Programme holder

IBU – Institut Bauen und Umwelt e.V.
 Panoramastr. 1
 10178 Berlin
 Germany

Declaration number

EPD-SAR-20200274-CBA2-EN

This declaration is based on the product category rules:

Mineral insulating materials, 12.2018
 (PCR checked and approved by the SVR)

Issue date

05/11/2021

Valid to

04/02/2026



Dipl. Ing. Hans Peters
 (chairman of Institut Bauen und Umwelt e.V.)



Dr. Alexander Röder
 (Managing Director Institut Bauen und Umwelt e.V.)

SAGLAN glass wool, bonded with bio-based adhesive

Owner of the declaration

Sager AG
 Dornhügelstrasse 10
 CH-5724 Dürrenäsch

Declared product / declared unit

1 kg uncoated SAGLAN glass wool, bonded with a bio-based adhesive.

The data per kg can simply be extrapolated to the quantity of a specific product used as density x thickness.

The appendix contains values for the following coatings per m², which can be added to the life cycle assessment values of the uncoated product:

- Glass fleece natural (0.035 kg/m²)
- Glass fleece natural (longitudinally reinforced) (0.055 kg/m²)
- Glass fleece natural (0.100 kg/m²)
- Glass fleece black (0.060 kg/m²)
- Glass fabric (0.128 kg/m²)
- Pure aluminium, grid-reinforced (0.079 kg/m²)
- Kraft paper (0.105 kg/m²)
- Alu/PET/Alu/PE (0.125 kg/m²)

Scope:

The declaration refers to SAGLAN glass wool, which is manufactured at the Sager AG site in Dürrenäsch/CH.

The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of *EN 15804+A2*. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard *EN 15804* serves as the core PCR

Independent verification of the declaration and data according to *ISO 14025:2010*

☐ internally ☒ externally



Dr. Eva Schmincke
 (Independent verifier)

Product

Product description/Product definition

The product declaration refers to products made of glass wool. Glass wool consists of man-made monofilament mineral fibres of non-crystalline structure. The average fibre diameter is between 3 and 6 µm. The production is monitored and certified by RAL and EUCB. The glass wool complies with the definition of glass wool according to German legislation on hazardous substances. The raw density of

SAGLAN products varies from 12 to 100 kg/m³. The average density of the products is around 30 kg/m³. The products are marketed under the name SAGLAN. They are commercially available in roll form or as slabs.

Regulation (EU) No 305/2011 (CPR) applies to the placing on the market of the product in the EU/EFTA (except Switzerland). The product requires a

declaration of performance taking into account *DIN EN 13162:2012+A1:2015, Thermal insulation products for buildings - Factory made mineral wool (MW) products specification* and the CE marking. The respective national regulations apply to the use.

Application

The areas of application are in building construction as thermal insulation of building services installations. The standard products are marketed under the name SAGLAN, those for technical applications under the name SAGLAN T.

As thermal insulation in buildings, the slabs or rolls are installed between the supporting structure in the roof/wall/ceiling and floor area as well as inside or outside the supporting structure.

Field of application in building construction:

- Thermal and sound insulation in pitched and flat roofs
- Rooftop insulation
- Thermal insulation of double-skin masonry walls
- Thermal insulation of ventilated facades
- External thermal insulation composite systems
- Internal partition walls
- Impact sound insulation in floating screed floors
- Timber frame construction
- Wooden ceilings
- Cassette walls
- Interior insulation in roof and wall
- Separating layers
- Upper storey ceiling
- Underground garages and basement ceilings
- Acoustic ceilings

In the area of building services:

- Insulation of heating systems
- Insulation of ventilation ducts
- Insulation of air conditioning ducts
- Insulation of apparatus
- Insulation of pipelines
- Insulation of hot water tanks
- Insulation of tanks
- Use in industrial processing
- Use in the automotive industry
- Use in shipbuilding

- Use with fire protection elements
- Processing

Technical Data

Name	Value	Unit
Thermal conductivity	0.03 - 0.04	W/(mK)
Calculation value for thermal conductivity	0.033 - 0.041	W/(mK)
Water vapour diffusion resistance factor	1	-
Water vapor diffusion equivalent air layer thickness	$\mu \times d$	m
Sound absorption coefficient	-	%
Gross density	12 - 100	kg/m ³
Compressive strength	0 - 20	N/mm ²
Resistance to temperature	250	°C
Fire code	A1	

The value apply to uncoated products.

Performance values of the product according to the declaration of performance in relation to its essential characteristics according to *DIN EN 13162:2012+A1:2015, Thermal insulation products for buildings - Factory made mineral wool (MW) products - Specification*.

Base materials/Ancillary materials

The essential raw materials for glass wool production are cullet (> 75 mass %), sand, soda (approx. 5 %), borax (approx. 8 %) and phonolite. The cross-linking of the fibres is achieved by using up to 8 % of a bio-based binder based on modified starch in the finished product.

1) The product/product/at least part of the product contains substances on the *ECHA* candidate list (date 16.07.2019) above 0.1% by mass: no.

Reference service life

A reference service life according to *ISO 15686* cannot be declared due to the different areas of application of SAGLAN glass wool.

The useful life of SAGLAN glass wool is in the order of magnitude of the useful life of the respective component or building.

LCA: Calculation rules

Declared Unit

The declared values refer to 1 kg of uncoated SAGLAN glass wool bonded with a bio-based adhesive.

Declared unit

Name	Value	Unit
conversion factor [Mass/Declared Unit]	-	-
Grammage	-	kg/m ²
Declared unit	1	kg

Layer thickness	-	m
conversion factor [Mass/Declared Unit]	-	-

The data per kg can easily be extrapolated to the quantity of a specific product used per m² as density (kg/m³) x thickness (m).

The appendix contains values for the following coatings per m², which can be added to the life cycle assessment values of the uncoated product:

- Glass fleece natural (0.035 kg/m²)
- Glass fleece natural (longitudinally reinforced) (0.055 kg/m²)
- Glass fleece natural (0.100 kg/m²)
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System boundary

Type of EPD: Cradle to factory gate - with options

Modules A1-A3 cover all material and energy flows required for the production of SAGLAN glass wool; the system boundary for waste glass is assumed to be at the point where it is sorted by type. Certified hydropower of European origin is inventoried for electricity consumption at the production site.

Module A4 includes transport to the construction site.

Module A5 involves the incineration of the transport packaging in a waste incineration plant (MWIP), with the recovered energy being exported to Module D. In addition, 2% waste is assumed in accordance with EN 16783, which means that a corresponding production quantity including packaging and transport

to the construction site and its disposal (waste and its packaging) are also inventoried in module A5.

Module C1: dust emissions are inventoried during deconstruction.

Module C2 comprises the transport of the deconstructed glass wool to a landfill for inert materials.

In **Module C3**, due to the assumed disposal scenario in an inert landfill, no environmental impacts occur in this module.

Module C4 covers the landfilling process of glass wool without taking into account the energetic utilisation of the landfill gas from the (small) organic components.

Module D includes the benefits from the production of electricity and heat generated from the thermal treatment of the packaging waste from the installation of the glass wool on the construction site (incl. 2 % of the packaging offcuts) from Module A5 in a MWIP.

Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to EN 15804 and the building context, respectively the product-specific characteristics of performance, are taken into account.

An updated version of ecoinvent 2.2 (KBOB 2016) has been used as the background database

LCA: Scenarios and additional technical information

Characteristic product properties Information on biogenic Carbon

Information describing the biogenic carbon content at the factory gate

Name	Value	Unit
Biogenic Carbon Content in product	0	kg C
Biogenic Carbon Content in accompanying packaging	0.01	kg C

Transport to the construction site (A4)

The transports from the factory to the construction site are calculated as a lump sum with a Swiss fleet average for trucks and a default distance of 100 km - this is in a realistic order of magnitude for Switzerland and can be easily scaled to the real transport distance between the factory and the construction site for project-specific calculations.

Transport was scaled to take into account the effective utilisation of the truck: the utilisation assumed in the data set is 9512 kg/load; the loading of SAGLAN glass wool for delivery in Switzerland varies between 3960 kg/load and 7040 kg/load, using the mean value of 5450 kg/load.

Installation in the building (A5)

Disposal of the packaging materials in a MWIP and incl. transport, production, transport to the construction site, installation and disposal of 2 % offcuts incl. their packaging. It is assumed that the PE films and the disposable pallets are used in a MWIP for energy

recovery. This assumes an efficiency of 28.51 % gross useful heat and 15.84 % electricity and a current average internal consumption of the MWIP of 0.1273 kWh electricity and 0.4853 MJ useful heat per kilogram of waste (status Switzerland, 2011; Doka 2015). A transport distance of 10 km by truck is inventoried for the waste incineration plant.

It is assumed that the insulation materials can be installed on-site without further effort.

End-of-life (C1–C4)

Module C1

The insulation material is deconstructed without relevant energy input, but causing particle emissions.

Module C2

The deconstructed building is transported by lorry as a Swiss fleet average to an inert material landfill as mixed construction demolition, assumed transport distance according to KBOB calculations: 15 km.

Module C3

A scenario is assumed in which 100 % of the glass wool is disposed of in an inert waste landfill. Therefore, no environmental impacts are shown in Module C3.

Module C4

100 % of the deconstructed glass wool is disposed of as mixed demolition waste in an inert landfill, without

taking into account the energetic use of the landfill gas from the (small) organic components.

Name	Value	Unit
Collected as mixed construction waste	1	kg
Landfilling	1	kg

Reuse, recovery and recycling potential (D)

The combustible waste from module A5 is recovered as energy in a waste incineration plant. The CH electricity mix (consumption mix) or heat from natural gas firing, condensing, modulating < 100kW is credited for the exported energy.

LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	ND	ND	MNR	MNR	MNR	ND	ND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 kg SAGLAN glass wool, bonded with bio-based adhesive

Core Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ -Eq.]	9.52E-1	2.41E-2	4.55E-1	0.00E+0	2.07E-3	0.00E+0	7.28E-3	-5.33E-2
GWP-fossil	[kg CO ₂ -Eq.]	1.12E+0	2.41E-2	1.74E-1	0.00E+0	2.07E-3	0.00E+0	7.28E-3	-5.32E-2
GWP-biogenic	[kg CO ₂ -Eq.]	-1.66E-1	-6.74E-6	2.81E-1	0.00E+0	-5.79E-7	0.00E+0	2.09E-7	-5.34E-5
GWP-luluc	[kg CO ₂ -Eq.]	1.15E-3	1.53E-6	1.47E-5	0.00E+0	1.32E-7	0.00E+0	4.50E-7	-4.01E-5
ODP	[kg CFC11-Eq.]	9.88E-8	1.23E-9	3.24E-9	0.00E+0	1.05E-10	0.00E+0	7.96E-10	-8.45E-9
AP	[mol H ⁺ -Eq.]	9.09E-3	1.72E-4	2.66E-4	0.00E+0	1.47E-5	0.00E+0	5.72E-5	-6.79E-5
EP-freshwater	[kg PO ₄ -Eq.]	3.31E-5	3.26E-7	1.07E-6	0.00E+0	2.80E-8	0.00E+0	6.19E-8	-8.45E-7
EP-marine	[kg N-Eq.]	8.82E-4	7.33E-5	4.77E-5	0.00E+0	6.30E-6	0.00E+0	2.38E-5	-1.42E-5
EP-terrestrial	[mol N-Eq.]	3.61E-2	8.06E-4	1.06E-3	0.00E+0	6.93E-5	0.00E+0	2.62E-4	-1.57E-4
POCP	[kg NMVOC-Eq.]	2.82E-3	2.28E-4	1.55E-4	0.00E+0	1.96E-5	0.00E+0	7.79E-5	-5.36E-5
ADPE	[kg Sb-Eq.]	1.73E-6	5.60E-8	5.62E-8	0.00E+0	4.81E-9	0.00E+0	6.78E-9	-1.62E-8
ADPF	[MJ]	1.48E+1	3.80E-1	7.44E-1	0.00E+0	3.26E-2	0.00E+0	1.84E-1	-1.46E+0
WDP	[m ³ world-Eq deprived]	1.13E+3	1.14E+0	1.37E+1	0.00E+0	9.83E-2	0.00E+0	3.60E-1	-3.93E+1

Caption: GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 kg SAGLAN glass wool, bonded with bio-based adhesive

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	[MJ]	7.65E+0	5.58E-3	8.99E-2	0.00E+0	4.80E-4	0.00E+0	1.72E-3	-1.58E-1
PERM	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	[MJ]	7.65E+0	5.58E-3	8.99E-2	0.00E+0	4.80E-4	0.00E+0	1.72E-3	-1.58E-1
PENRE	[MJ]	2.13E+1	3.80E-1	7.45E-1	0.00E+0	3.26E-2	0.00E+0	1.84E-1	-1.46E+0
PENRM	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRT	[MJ]	2.13E+1	3.80E-1	7.45E-1	0.00E+0	3.26E-2	0.00E+0	1.84E-1	-1.46E+0
SM	[kg]	7.50E-1	0.00E+0	1.50E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	[m ³]	2.56E-2	1.77E-4	8.14E-4	0.00E+0	1.52E-5	0.00E+0	1.99E-4	-6.82E-4

Caption: PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 kg SAGLAN glass wool, bonded with bio-based adhesive

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	[kg]	2.13E-5	4.30E-7	7.09E-7	0.00E+0	3.70E-8	0.00E+0	6.26E-8	-5.05E-7
NHWD	[kg]	2.13E-1	3.35E-3	2.97E-2	0.00E+0	2.88E-4	0.00E+0	9.99E-1	-1.56E-3
RWD	[kg]	2.46E-5	4.24E-7	5.12E-6	0.00E+0	3.64E-8	0.00E+0	1.32E-7	-1.47E-5
CRU	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MER	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EEE	[MJ]	0.00E+0	0.00E+0	3.39E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	6.51E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0

Caption: HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 kg SAGLAN glass wool, bonded with bio-based adhesive

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	[Disease Incidence]	7.18E-8	1.83E-9	2.17E-9	3.96E-9	1.57E-10	0.00E+0	1.07E-9	-2.62E-10
IRP	[kBq U235-Eq.]	2.59E-2	6.78E-4	8.41E-3	0.00E+0	5.82E-5	0.00E+0	2.11E-4	-2.44E-2
ETP-fw	[CTUe]	1.16E+1	1.68E-1	4.24E-1	0.00E+0	1.45E-2	0.00E+0	6.14E-2	-2.14E-1
HTP-c	[CTUh]	2.24E-10	1.44E-11	5.00E-11	0.00E+0	1.24E-12	0.00E+0	2.53E-12	-5.70E-12
HTP-nc	[CTUh]	5.91E-9	2.66E-10	8.04E-10	0.00E+0	2.28E-11	0.00E+0	6.49E-11	-1.15E-10
SQP	[-]	1.27E+0	4.83E-2	4.18E-2	0.00E+0	4.15E-3	0.00E+0	3.23E-1	-1.12E-2
Caption	PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index								

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”.

This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”.

The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

References

Standards

EN 15804

DIN EN 15804:2012+A2:2019, Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products; German version EN 15804:2012+A2:2019.

EN 13162:2012+A1:2015

DIN EN 13162:2015-04, Thermal insulation products for buildings - Factory made mineral wool (MW) products - Specification; German version EN 13162:2012+A1:2015.

EN 16783

DIN EN 16783:2018-03, Thermal insulation products - Product category rules (PCR) for factory made and in-situ formed products for preparing environmental product declarations; German version EN 16783:2017.

ISO 14025

DIN EN ISO 14025:2011-10, Environmental labels and declarations - Type III environmental declarations - Principles and procedures.

ISO 15686

Buildings and constructed assets - Service life planning; several parts.

Further literature

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Doka 2015

Doka (2015): Aktualisierung der LCI Daten zu Kehrlichtverbrennung (Teilprojekt 8). In: Werner F., Bauer C., Büsler S., Doka G., Kaufmann E., Kono J., Luginbühl, U., Mina M., Frischknecht R., Thees O., Wallbaum H., Zimmermann W., Hischer R. (2015): Aktualisierung der Modelle und Datensätze zu Holz und Holzprodukten in der Datenbank ecoinvent. Auftraggeberin: Bundesamt für Umwelt, Aktionsplan Holz, Bern, Auftragnehmer: Eidgenössische Materialprüfungs- und Forschungsanstalt EMPA. Schlussbericht 18. Februar 2015. S. 86-92.

ECHA

The Candidate List of substances of very high concern, available via <https://echa.europa.eu/nl/-/four-news-substances-added-to-the-candidate-list>.

KBOB 2016

KBOB, eco-bau und IPB (2016) ecoinvent Datenbestand 2016 basierend auf Datenbestand ecoinvent 2.2; Grundlage für die KBOB Empfehlung 2009/1:2016: Ökobilanzdaten im Baubereich. Stand April 2016. Koordinationskonferenz der Bau- und Liegenschaftsorgane der öffentlichen Bauherren c/o BBL Bundesamt für Bauten und Logistik.

**Publisher**

Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Germany

Tel +49 (0)30 3087748- 0
Fax +49 (0)30 3087748- 29
Mail info@ibu-epd.com
Web www.ibu-epd.com

**Programme holder**

Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Germany

Tel +49 (0)30 - 3087748- 0
Fax +49 (0)30 - 3087748 - 29
Mail info@ibu-epd.com
Web www.ibu-epd.com

Dr. Frank Werner

Umwelt & Entwicklung

**Author of the Life Cycle
Assessment**

Dr. Frank Werner - Umwelt &
Entwicklung
Idaplatz 3
8003 Zürich
Switzerland

Tel + 41 (0)44 241 39 06
Fax + 41 (0)44 461 33 28
Mail frank@frankwerner.ch
Web <http://www.frankwerner.ch/>

simply better insulation

**Owner of the Declaration**

Sager AG
Dornhügelstrasse 10
5724 Dürrenäsch
Switzerland

Tel +41 62 767 87 87
Fax +41 62 767 87 80
Mail info@sager.ch
Web www.sager.ch